Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Horseshoe Creek

Water Body Segment at a Glance:

Counties: Lafayette, Jackson
Nearby Cities: Oak Grove
Length of impairment: 3.1 miles
Pollutants: Biochemical Oxygen Demand (BOD) and Ammonia
Source: Oak Grove North and South Wastewater Lagoons
Water Body ID: 3413


State map showing location of watershed

TMDL Priority Ranking: Permit-in-Lieu of TMDL accepted 2006

Description of the Problem

Designated beneficial uses of Horseshoe Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health (Fish Consumption)

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

- The Missouri Water Quality Standard (WQS), found in 10 CSR 20-7.031 Table A, for dissolved oxygen (DO) in streams is 5.0 mg/L (milligrams per liter or parts per million).
- The standards for ammonia vary with water temperature and pH. At typical temperatures and pH values, a summer ammonia standard would be 1.2 mg/L with a winter standard of 2.1 mg/L. These values are taken from Table B in 10 CSR 20-7.031.

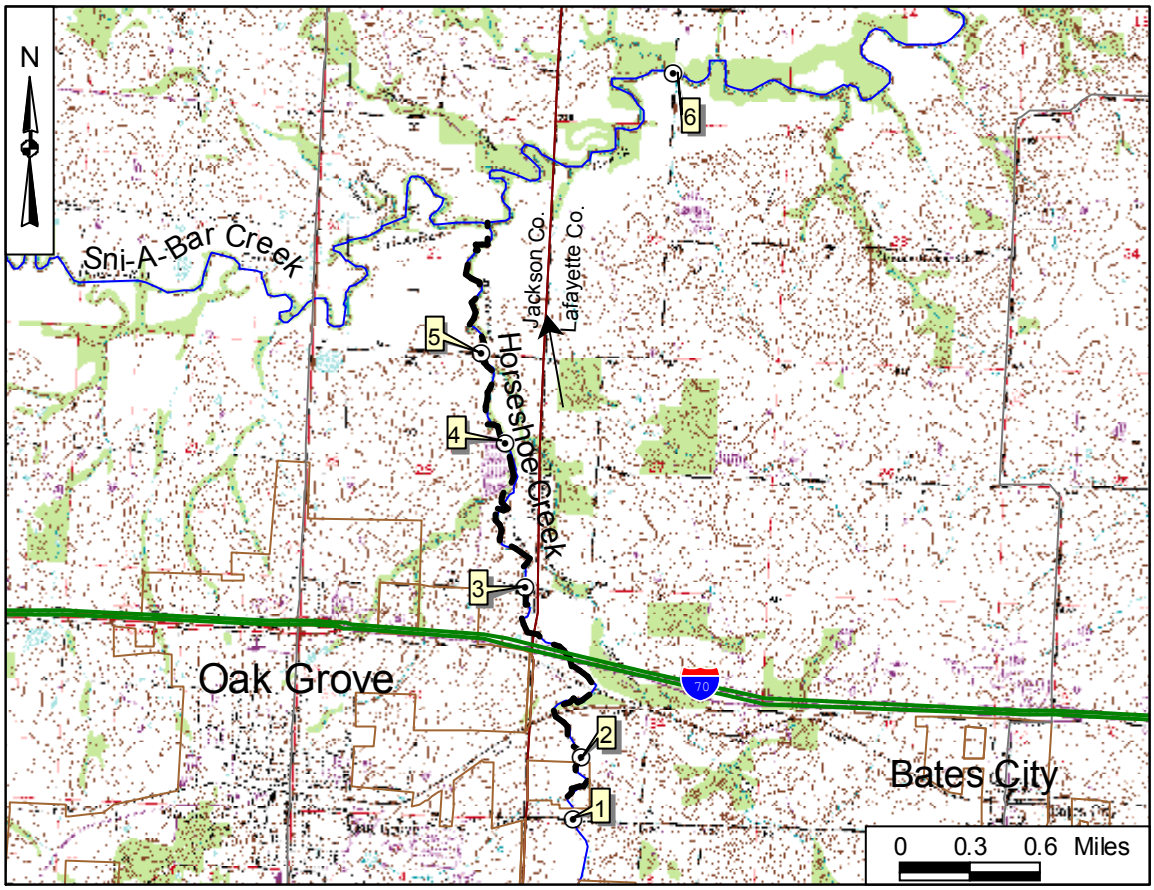
Background information and water quality data

Conditions in Horseshoe Creek were not protective of aquatic life. In water quality studies of Horseshoe Creek and Sni-A-Bar Creek downstream of Horseshoe Creek conducted in August 2001 and July 2003, the creek was found to be high in ammonia. Ammonia is a common by-product of wastewater treatment and, under certain conditions, can be toxic to aquatic life. Also, low levels of DO were documented in the creek and many aquatic organisms require high levels of oxygen to survive. Wastewater effluent that is high in BOD will lower the DO in a stream. Both of these

conditions in Horseshoe Creek are due to discharges from the Oak Grove Lagoons. A mechanical treatment plant that discharges to a tributary of Sni-a-Bar Creek was constructed to replace the Oak Grove lagoons in 2005. The new plant eliminates the discharges to Horseshoe Creek. Like all wastewater discharges in Missouri, the new Oak Grove WWTP must meet the requirements of a discharge permit issued by the Missouri Department of Natural Resources. The new plant can meet the water quality standards by complying with the effluent limits in the permit. A new permit was issued Jan 13, 2006 and the department submitted the permit in lieu of a TMDL to the U.S. Environmental Protection Agency, or EPA, for approval Feb. 23, 2006.

The water quality data from the studies mentioned above are shown in the table on the next page.

Horseshoe Creek in Lafayette and Jackson Counties, Missouri



Impaired Segment ← Direction of flow

Sampling Sites

1 – Horseshoe Creek 0.1 mile upstream of South Lagoon
2 – Discharge from South Lagoon
3 – Horseshoe Creek 1.1 mile downstream of South Lagoon
4 – Discharge from North Lagoon
5 – Horseshoe Creek 0.4 mile downstream of North Lagoon
6 – Sni-A-Bar Creek 2 miles downstream of mouth of Horseshoe Creek

Summary of Water Quality Studies on Horseshoe Creek by the Department of Natural Resources, August 2001 and July 2003					
Site #	**Flow (cubic feet per second)**	**Mean Water Temperature (in degrees Celsius)**	**pH**	**Mean Ammonia as Nitrogen (mg/L)**	**Mean Early Morning Dissolved Oxygen (mg/L)***
1	0.25	28	7.6	0.01499	3.3
2	0.55	29	7.6	20.4	1.4
3	0.25	27	7.5	13.9	1.7
4	0.35	29	7.9	5.23	2.1
5	0.46	27	7.6	7.73	0.8
6	7.80	28	7.5	0.15	3.3

*To be most protective of water quality, DO is measured in the early morning, when it is at its lowest.

The U.S. Environmental Protection agency accepted the permit in Lieu of a TMDL on April 21, 2006.

For more information call or write:
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